Collider-Accelerator Department

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Memo

date: *December 17, 2008*

to: *RSC*

from: *D. Beavis*

subject: *Gate at 4GE1*

I examined the note written by A. Stevens on the shielding area and 4GE1 dated 3/25/98. I did a quick calculation using the formula dose=38800*exp-d/1.78/)rt*rt where this is rem per DBA, 1.78 is the soil attenuation scaled by density, rt is the transverse distance in feet, and d is the shielding thickness in feet. I got a dose of 3.0 rem for a DBA at the present gate location and Alan got 1.8 rem using a Monte Carlo. Using a labyrinth formula for neutrons going through the labyrinth I got an additional 1.6 rem. Alan's number should have both but he is using more realistic fault locations and not assuming the source is directly centered at the opening.

If the gate is moved the punch-through increases by 20% but the labyrinth dose increases by a factor of 6. Using my labyrinth dose of 1.6 rem this scales to 9.6 rem if the gate is moved forward. This exceeds the dose guideline used for the area design for areas at man height (see Alan's note).

I do NOT recommend moving the gate towards the ring. If someone wants to strongly disagree with this assessment then we will have to have a meeting of a sub-committee.

cc: R. Karol
A. Pendzick
J. Reich
RSC RHIC File